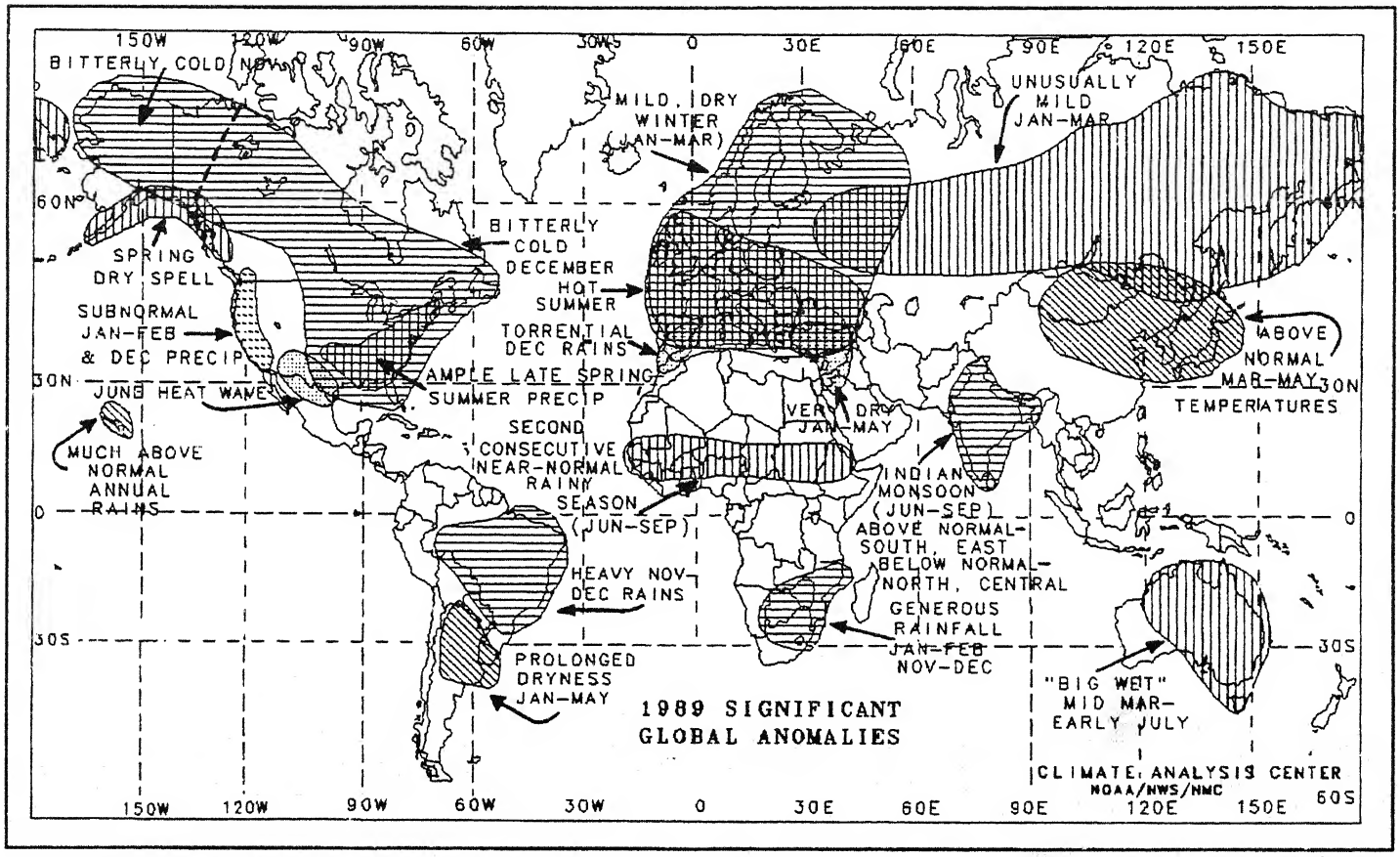
CLIMATE ANALYSIS CENTER

CONTAINS:
THE 1989 SIGNIFICANT GLOBAL CLIMATE ANOMALIES

WEEKLY CLIMATE BULLETIN

No. 90/03 **Washington, DC** **January 20, 1990**



FOR FURTHER INFORMATION ON THE SIGNIFICANT GLOBAL ANOMALIES DURING 1989, REFER TO THE SPECIAL CLIMATE SUMMARY BEGINNING ON PAGE 11. IN ADDITION, THE INDEX TO THE 1989 WEEKLY CLIMATE BULLETIN IS CONTAINED ON PAGES 17 – 20.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE–NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JANUARY 20, 1990

Canada and United States:

JANUARY THAW REPLACES DECEMBER DEEP FREEZE.

n unseasonably mild weather pattern persisted across uthwestern Canada and the north–central U.S. and engulfed e remainder of the eastern two–thirds of the nation and the uthern tier of Alaska. Temperatures averaged up to 11°C ove normal, and some stations in the northern Great Plains ve recorded departures in excess of +9°C since January 1 [3 eeks].

Western United States and Southwestern Canada:

LIGHT TO MODERATE PRECIPITATION OBSERVED.

etween 10 and 20 mm of precipitation fell over the region hile a few isolated stations in southern California and western ashington measured nearly 50 mm. This week's diminished tals eased flooding conditions in the Pacific Northwest but nited relief from December's dryness elsewhere. Longer–term oisture deficits were negligibly reduced [Ending at 8 week].

Brazil:

EXCESSIVE RAINFALL CEASES.

ockets of moderate to heavy rainfall were observed across xtreme southern and western portions of the nation with nounts ranging from 50 to 200 mm. Elsewhere, little or no in fell as dry weather returned to the previously soaked rtheastern states [Ended at 8 weeks].

Northern Argentina:

COOLER WEATHER ENDS HOT SPELL.

mperatures averaged between 2°C and 5°C below normal roughout the region as the recent warm spell ended [Ended ter 4 weeks].

5. *Europe*:

MOISTURE DEFICITS ACCUMULATE AS THE BALKANS REMAIN COLD.

Although heavy precipitation affected Scotland and portions of Scandinavia, most of continental Europe recorded less than 20 mm of precipitation. Much of central Europe, from southern France to the Ukraine, have received less than 25% of the normal precipitation during the past four weeks [8 weeks]. In addition, cold weather continued across southeastern Europe for the third consecutive week as departures of –4°C to –8°C afflicted portions of Bulgaria, Yugoslavia, and Turkey [3 weeks].

6. *Zimbabwe, Mozambique, and Northern Madagascar*:

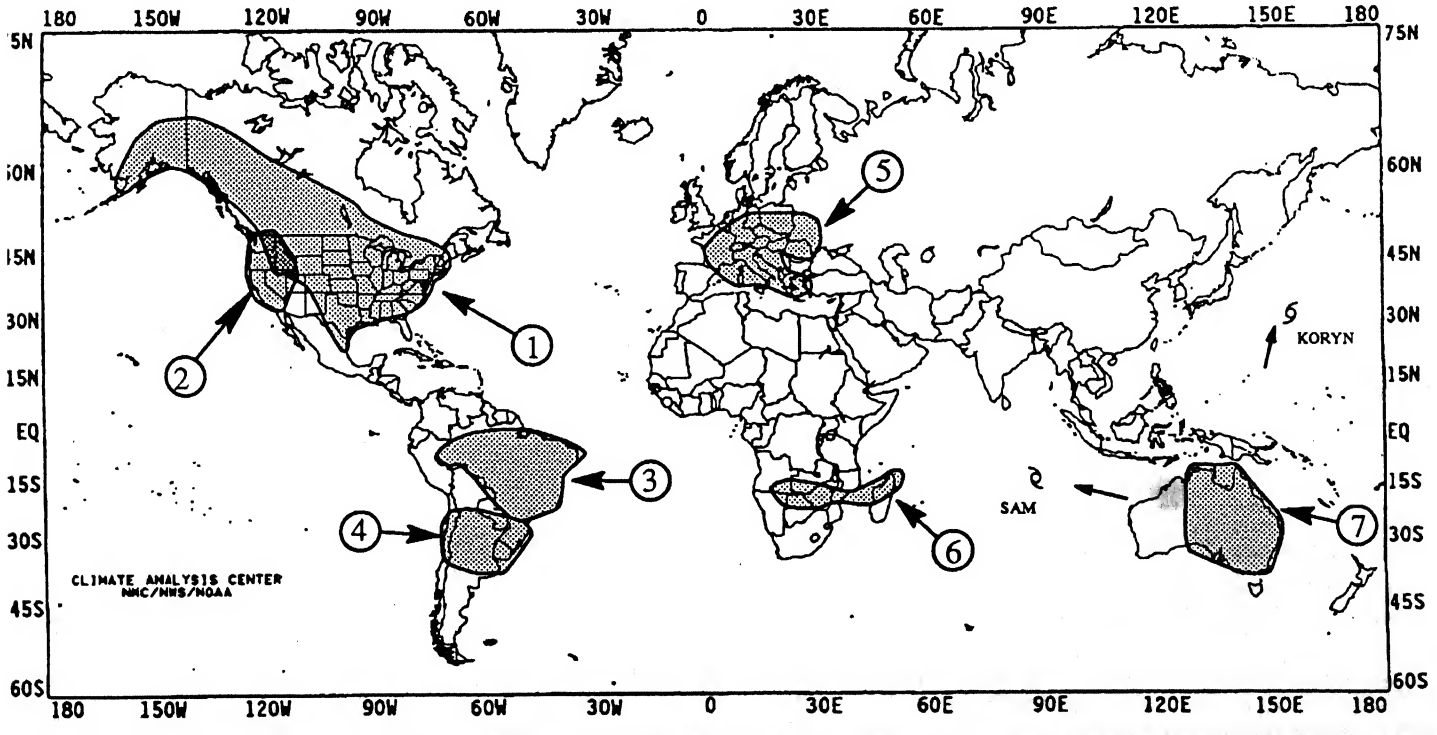
RAINFALL ABATES SLIGHTLY.

Less than 100 mm of rain fell throughout Madagascar, a significant decrease from previous weeks, but inundating rains (up to 259 mm) continued across Zambia, northern Zimbabwe, Malawi, and central Mozambique. Several stations across the region have observed more than twice the normal rainfall since January 1 [3 weeks].

7. *Eastern Australia*:

HIGH TEMPERATURES FADE WHILE DRYNESS PERSISTS.

Arnhem Land and northern portions of the Cape York Peninsula once again recorded moderate to heavy rainfall (between 50 and 100 mm), but relatively dry weather continued across most of eastern Australia as most locations recorded under 20 mm [5 weeks]. Fortunately, temperatures across the continent averaged within 3°C of normal as the recent period of heat ended [Ended after 5 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.
MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long–term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF JANUARY 14 THROUGH JANUARY 20, 1990.

Similar to last week, unseasonably mild conditions covered most of the lower 48 states while Pacific storm systems dropped light to moderate precipitation on the Far West. Farther east, a slow–moving, complex storm system produced numerous heavy showers and thunderstorms across the south–central Great Plains and the lower Mississippi Valley. In the colder air to the north and west of the low pressure center, moderate to heavy snows blanketed the southern sections of the Rockies and High Plains, the central Great Plains, the western Corn Belt, the Great Lakes region, and central New England. Wet weather returned to the Hawaiian Islands, and most of Alaska recorded much above normal temperatures and generous precipitation.

As the week commenced, a storm system was located over the Great Basin, generating heavy rain and snow over California and Nevada. Farther east, sunny skies and strong southerly winds pushed temperatures well into the sixties as far north as the central Great Plains. The storm slowly trekked eastward on Monday, bringing snow to the central Rockies and High Plains while a new storm system approached the Washington coast. Spring–like warmth was experienced in the central third of the country as several new daily maximum temperature records were set.

By mid–week, severe weather developed across the southern and central Great Plains in conjunction with the first storm system as thunderstorms pelted parts of Oklahoma, Kansas, and Texas with hail. Record–breaking warmth prevailed in the East on Wednesday and Thursday as highs touched 70°F in Maryland and West Virginia (see Figure 1). The second storm system moved southeastward into the desert Southwest, setting the stage for another round of precipitation across California, Nevada, and Arizona. Colder air invaded the central and northeastern U.S. as the first system rapidly lifted northeastward into southeastern Canada.

Towards the end of the week, the second storm system tracked across the southern Rockies, burying parts of New Mexico and Colorado under 1–3 feet of snow. As the low pressure center pushed northeastward into the south–central Great Plains, heavy snows whitened portions of Colorado, Kansas, Nebraska, South Dakota, and Iowa. In the warm, tropical air preceding the low pressure center and its associated cold front, intense thunderstorms spawned at least three tornadoes near Lufkin, TX while torrential downpours soaked most of the lower and middle Mississippi Valley. On Saturday, the storm had advanced northeastward and was located over the Ohio Valley. A band of snow and ice made travel hazardous from Iowa and Minnesota eastward into Pennsylvania and southern New England. Farther south, showers and thunderstorms occurring ahead of the cold front soaked the Tennessee Valley and parts of the Deep South. Meanwhile, most of Florida enjoyed fair skies and readings in the eighties.

Based upon the River Forecast Centers, the greatest weekly totals (between 4 and 9 inches) in the contiguous U.S. were observed in the south–central Great Plains, the lower Mississippi Valley, and in sections of Mississippi, Alabama, and Georgia (see Table 1, Figure 2). This was the first significant precipitation in the south–central Great Plains since late October–early November; however, this region had experienced excessive rainfall during May–September. Elsewhere, moderate to heavy amounts (between 1 and 3 inches) were recorded in portions of the Far West, the southern and central Rockies, the central Plains, Midwest, and the central Appalachians. Heavy precipitation also fell along Alaska's southern coast and throughout Hawaii.

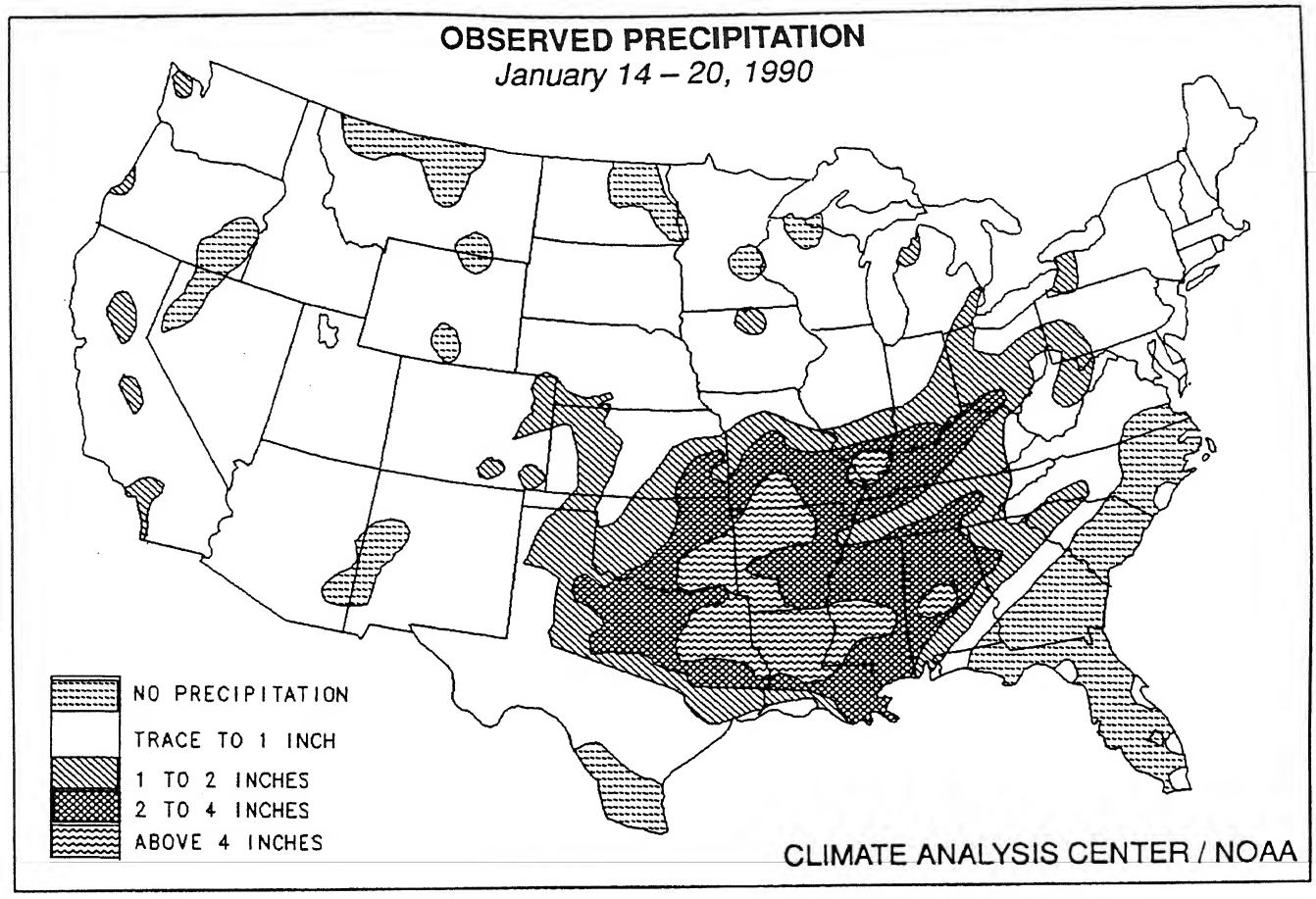
Light to moderate precipitation occurred throughout the rest of the Far West, in most of the Intermountain West, Rockies, and Plains, and across the Southeast, lower Midwest, and the Northeast. Little or no precipitation fell on the desert Southwest, from northeastern Washington eastward to Wisconsin, and along the eastern Gulf and southern half of the Atlantic Coasts.

Historically, mid to late January is normally the coldest time of the year in the lower 48 states. This year, however, December's bitterly cold weather quickly faded as January commenced. Unseasonably mild weather has now persisted during the past four week in the northern Rockies and the northern and central Plains. In addition, well above normal temperatures have dominated the Midwest and the Northeast, with the exception of northern Maine, for the third successive week. This week's greatest departures (between +15°F and +20°F) were found in the northern and southern Great Plains, throughout the Midwest and the Tennessee Valley, and in southern and central Alaska, where temperatures averaged up to 33°F above normal at Gulkana (see Table 2). The remainder of the nation, with the exception of California and the desert Southwest, observed milder than usual conditions.

Subnormal temperatures were scarce across the contiguous United States, and the greatest negative departures, located in southern California and central Arizona, were only between –2°F and –5°F. In Alaska, below normal temperatures were only found in the extreme northern part of the state as departures approached –12°F (see Table 3).

TABLE 1. Selected stations with 3.50 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
BOSSIER/BARKSDALE AFB, LA	6.29	FORT SMITH, AR	4.34
SHREVEPORT, LA	6.19	LITTLE ROCK AFB, AR	4.29
HILO/LYMAN, HAWAII, HI	6.06	BILOXI/KEESLER AFB, MS	3.96
KOKEE, KAUAI, HI	5.85	MONROE, LA	3.90
CENTERVILLE, GA	5.59	PADUCAH, KY	3.86
FAYETTEVILLE, AR	5.52	BATON ROUGE, LA	3.85
ALEXANDRIA/ENGLAND AFB, LA	5.08	HONOLULU, OAHU, HI	3.77
VALDEZ, AK	4.93	DALLAS-FORT WORTH, TX	3.75
JACKSON, MS	4.91	MERIDIAN, MS	3.71
HARRISON, AR	4.84	NEW ORLEANS/LAKE FRONT, LA	3.67
CORDOVA/MILE 13, AK	4.71	WEST PLAINS, MO	3.66
CAPE GIRARDEAU, MO	4.51	LITTLE ROCK, AR	3.59
YAKUTAT, AK	4.50	HOPKINSVILLE/CAMPBELL AFB, TN	3.56
MCALESTER, OK	4.42	KAHALUI, MAUI, HI	3.54
SPRINGFIELD, MO	4.35		


OBSERVED PRECIPITATION
January 14 – 20, 1990
NO PRECIPITATION
TRACE TO 1 INCH
1 TO 2 INCHES
2 TO 4 INCHES
ABOVE 4 INCHES
CLIMATE ANALYSIS CENTER / NOAA

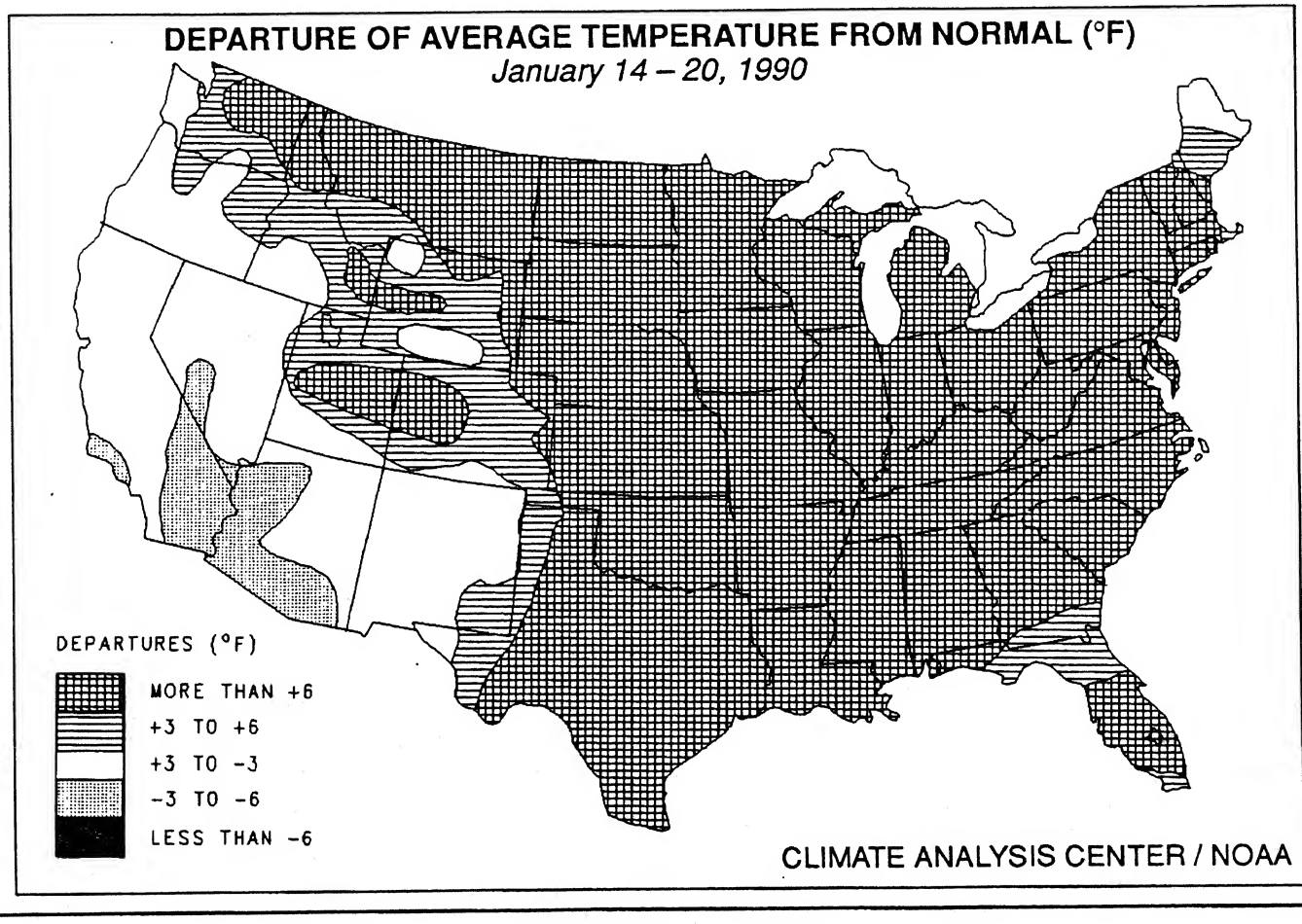

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
January 14 – 20, 1990
DEPARTURES (°F)
MORE THAN +6
+3 TO +6
+3 TO -3
-3 TO -6
LESS THAN -6
CLIMATE ANALYSIS CENTER / NOAA

TABLE 2. Selected stations with temperatures averaging 17.0°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
GULKANA, AK	+33.5	24.7	GRAND FORKS, ND	+18.1	19.5
BIG DELTA, AK	+21.8	15.6	SPRINGFIELD, IL	+18.0	41.6
FAIRBANKS, AK	+20.6	8.4	WATERLOO, IA	+17.9	31.6
ROCHESTER, MN	+20.0	29.0	MASON CITY, IA	+17.8	29.9
NORTHWAY, AK	+19.3	-2.6	CEDAR RAPIDS, IA	+17.7	35.7
FARGO, ND	+18.8	22.5	KENAI, AK	+17.7	27.7
LOUISVILLE, KY	+18.7	50.7	TALKEETNA, AK	+17.7	26.4
KING SALMON, AK	+18.7	31.5	JAMESTOWN, ND	+17.7	22.3
EVANSVILLE, IN	+18.5	49.1	QUINCY, IL	+17.6	40.6
ST. LOUIS, MO	+18.4	46.9	PEORIA, IL	+17.6	38.8
CHICAGO/O'HARE, IL	+18.3	38.1	DES MOINES, IA	+17.6	35.7
ANCHORAGE, AK	+18.3	30.5	LEXINGTON, KY	+17.4	48.7
PADUCAH, KY	+18.2	51.1	INDIANAPOLIS, IN	+17.3	43.1
CINCINNATI, OH	+18.2	47.0	ST. CLOUD, MN	+17.3	23.9
DUBUQUE, IA	+18.2	33.4	NASHVILLE, TN	+17.1	53.8
OTTUMWA, IA	+18.1	37.5	MINNEAPOLIS, MN	+17.1	27.5
MINOT, ND	+18.1	23.6	AUSTIN, TX	+17.0	65.8
ALEXANDRIA, MN	+18.1	22.9	ILIAMNA, AK	+17.0	31.4
DEVIL'S LAKE, ND	+18.1	20.9	ABERDEEN, SD	+17.0	24.4

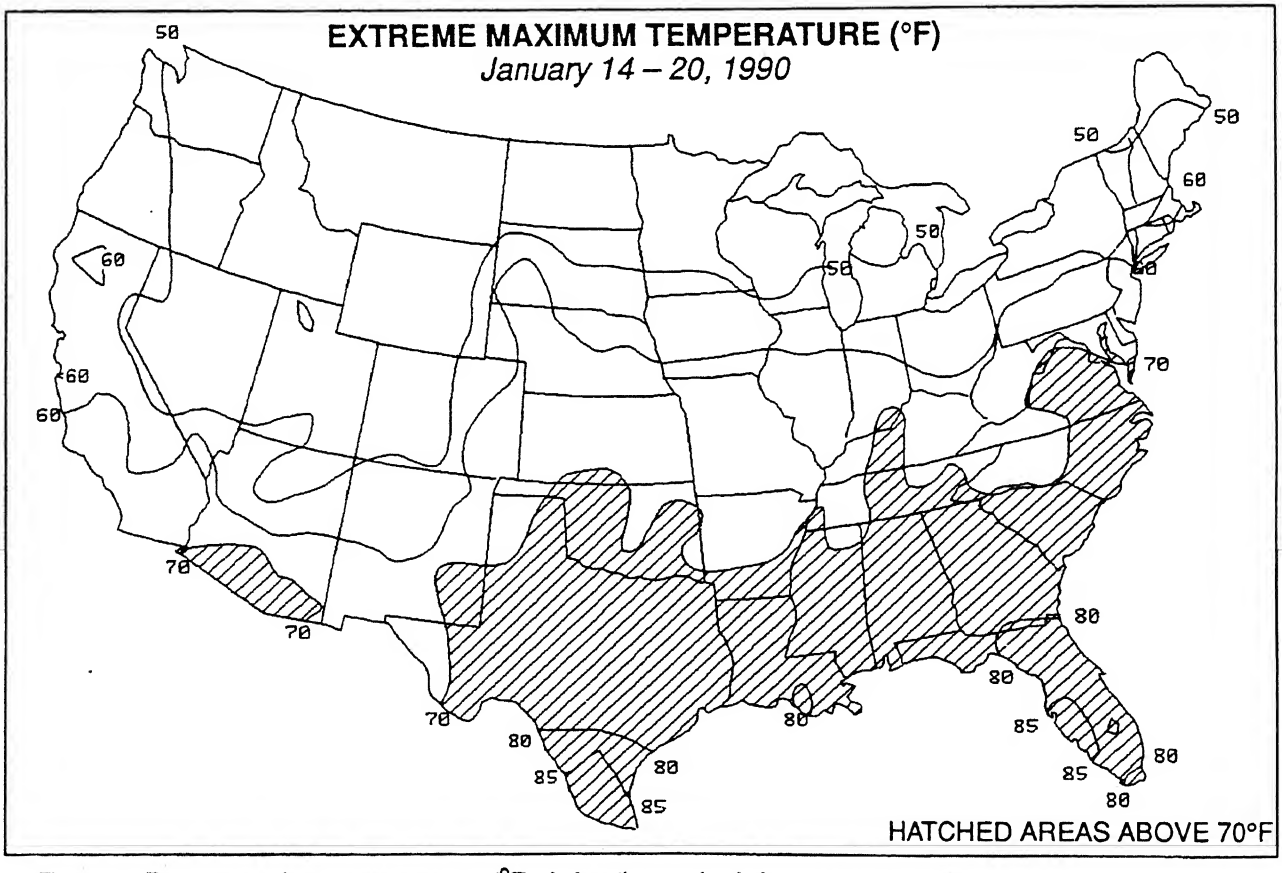
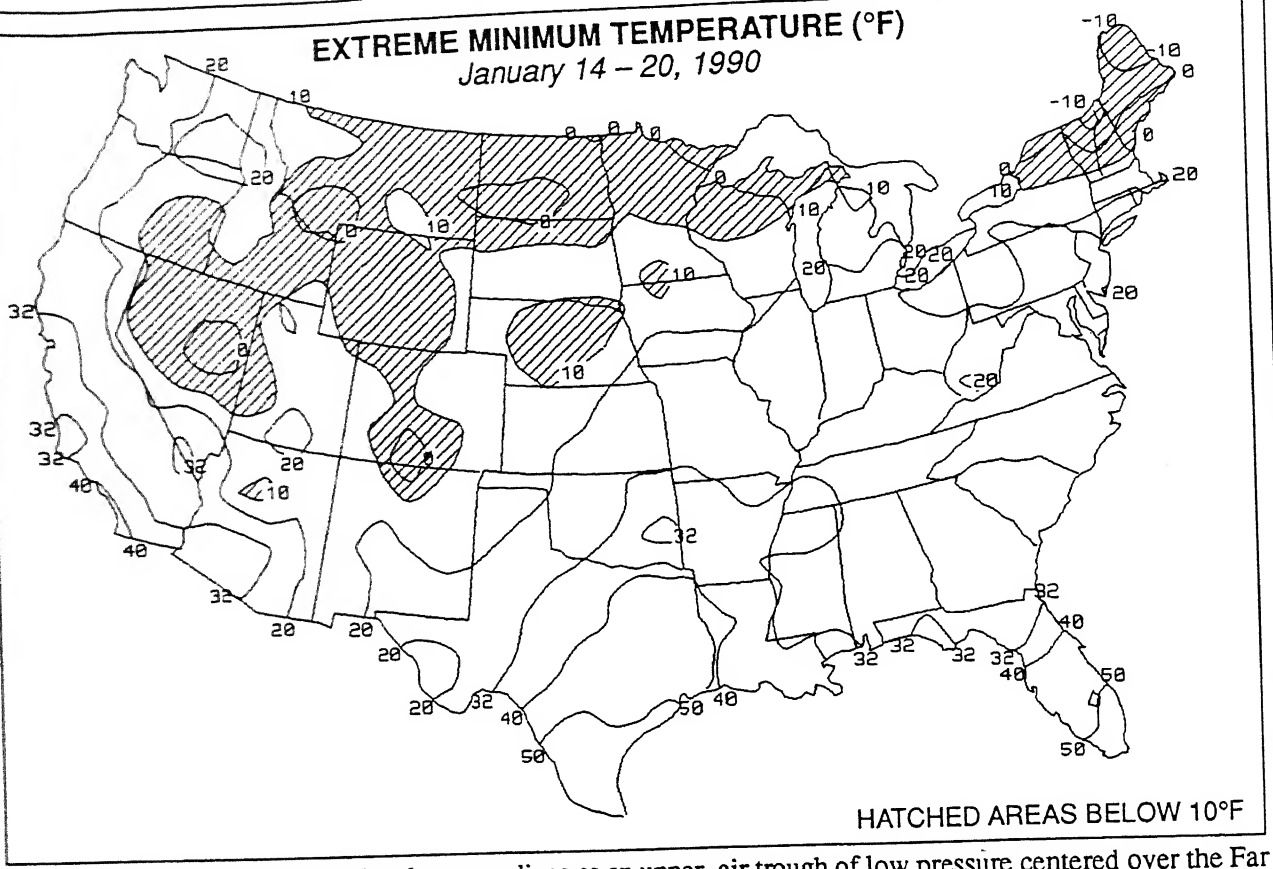


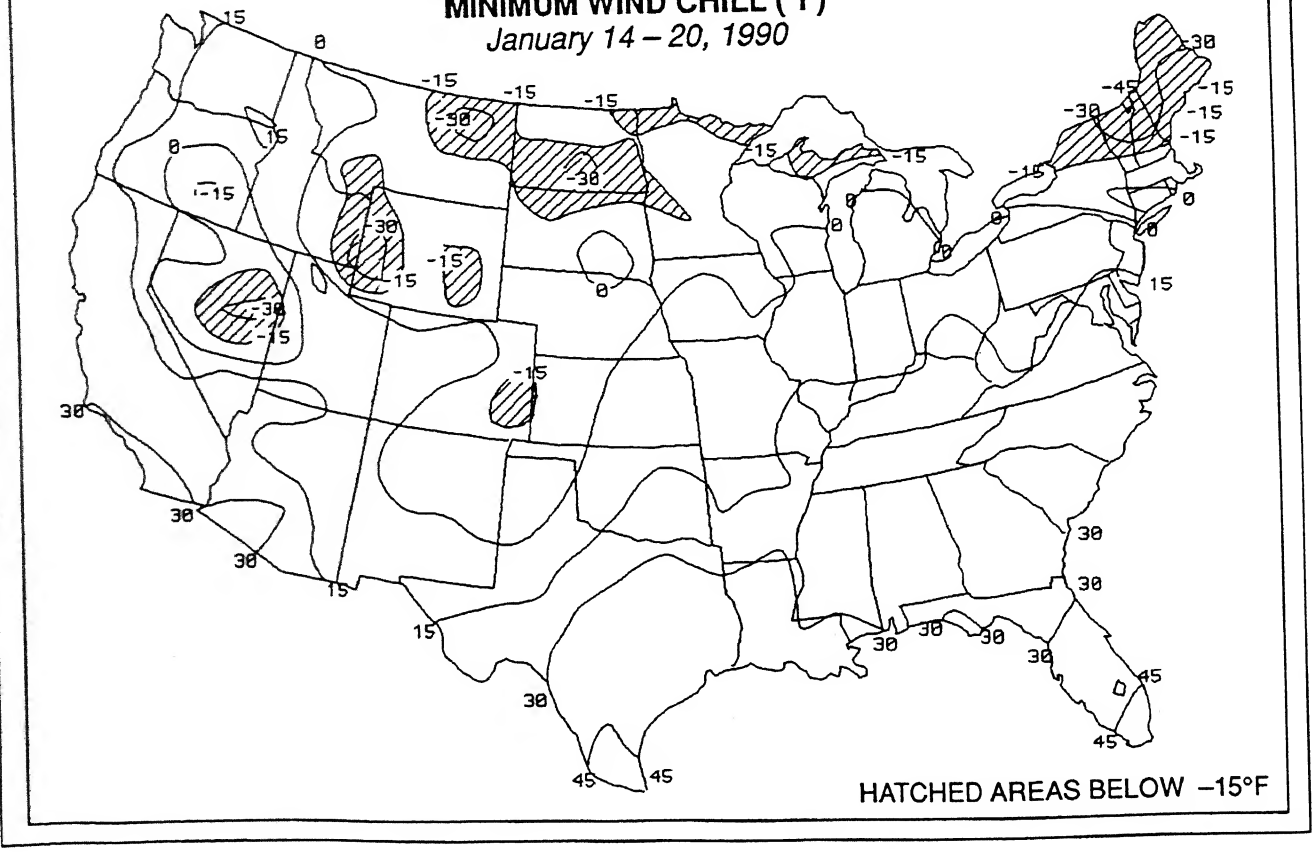
Figure 1. Extreme maximum temperatures (°F) during the week of January 14-20, 1990. Shaded areas are more than 70°F, and isotherms are only drawn for 85°F and for every 10°F starting at 50°F and ending at 80°F. Readings more typical of early April than mid-winter covered parts of the central Plains, lower Midwest, Southeast, and mid-Atlantic as highs reached into the seventies as far north as Indiana, West Virginia, and Maryland while sixties pushed into South Dakota and Massachusetts. Normally, most of the lower 48 states experience the lowest temperatures of the year during mid to late January.

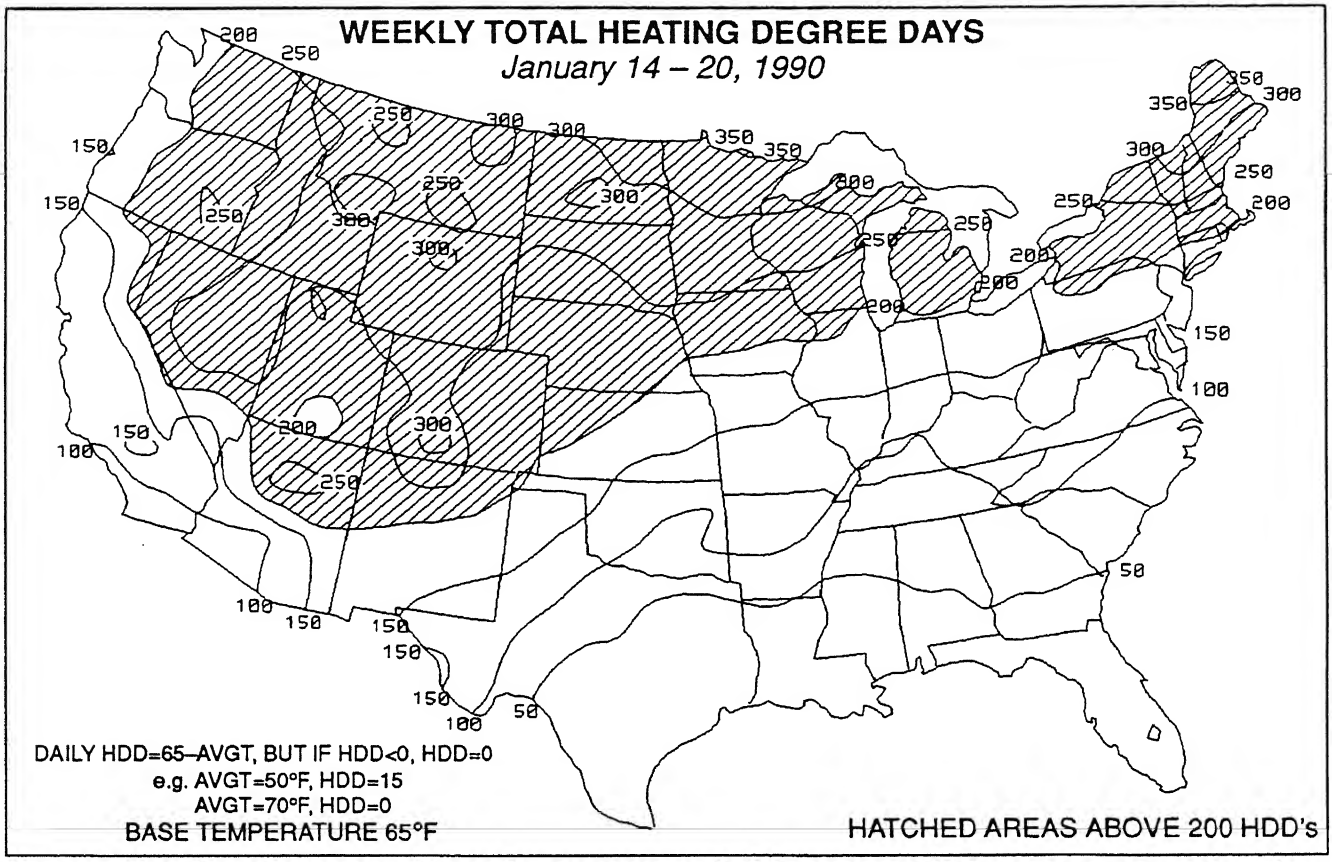
TABLE 3. Selected stations with temperatures averaging 2.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BARTER ISLAND, AK	-11.9	-26.3	DOUGLAS, AZ	-3.1	41.8
BARROW, AK	-10.9	-25.0	TUCSON, AZ	-3.0	48.0
PRESCOTT, AZ	-4.9	31.2	LOS ANGELES, CA	-3.0	52.8
BLUE CANYON, CA	-4.0	32.9	DAGGETT, CA	-2.8	45.4
BLYTHE, CA	-4.0	49.3	YUMA, AZ	-2.8	53.0
TUCSON/DAVIS-MONTHAN AFB, AZ	-3.9	46.2	BURLEY, ID	-2.7	23.8
TONOPAH, NV	-3.6	27.1	FLAGSTAFF, AZ	-2.7	25.4
SAN BERNADINO/NORTON AFB, CA	-3.4	47.9	IMPERIAL, CA	-2.5	53.0
SANTA BARBARA, CA	-3.4	48.5	LONG BEACH, CA	-2.4	53.2
UKIAH, CA	-3.2	43.3	SAN DIEGO/LINDBERGH, CA	-2.4	54.3
THERMAL, CA	-3.2	50.8	SANTA MARIA, CA	-2.2	48.4

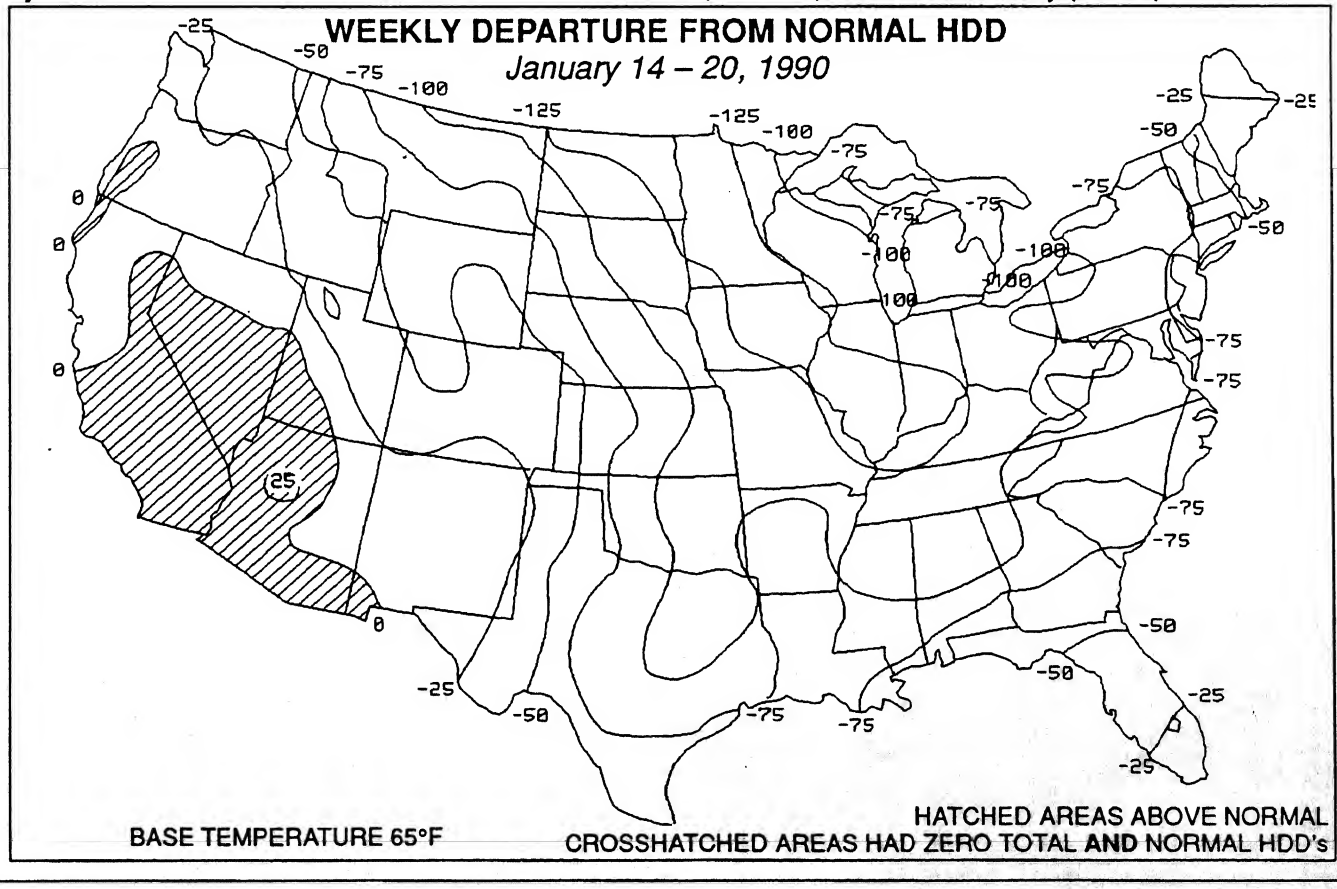


Very few locations experienced subzero readings as an upper–air trough of low pressure centered over the Far West brought mild, southwesterly flow to most of the U. S. (top). Dangerous wind chills (less than –15°F) were similarly limited to the northern parts of the Plains, Rockies, and New England (bottom).





Unseasonably mild weather continued during January across much of the contiguous U. S. as weekly heating totals above 300 HDDs were limited to portions of the Rockies, northern Plains, upper Midwest, and northern New England (top). Above normal weekly temperatures covered all but the extreme southwestern quarter of the country, reducing the heating demand by more than 100 HDDs in the northern and central Great Plains, Midwest, and Tennessee Valley (bottom).



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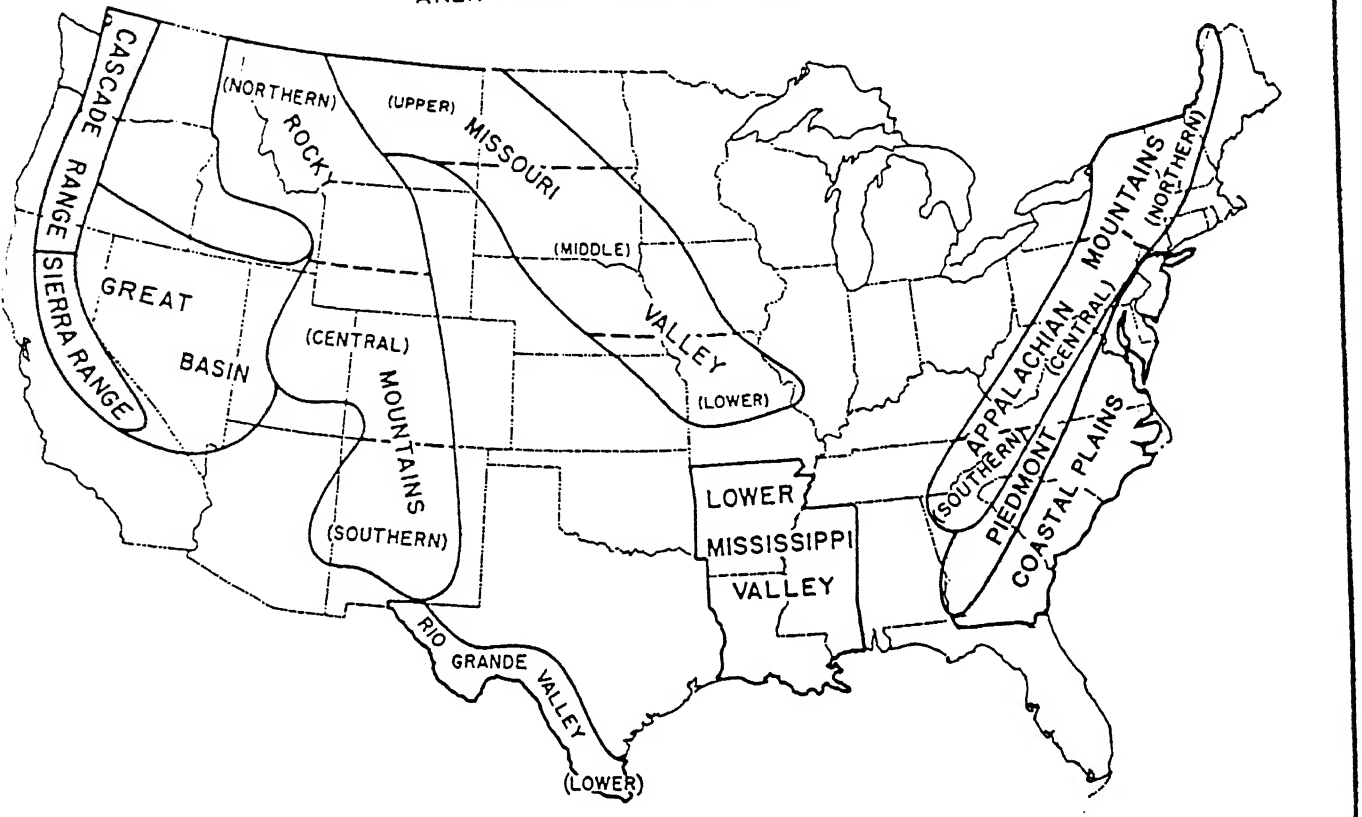

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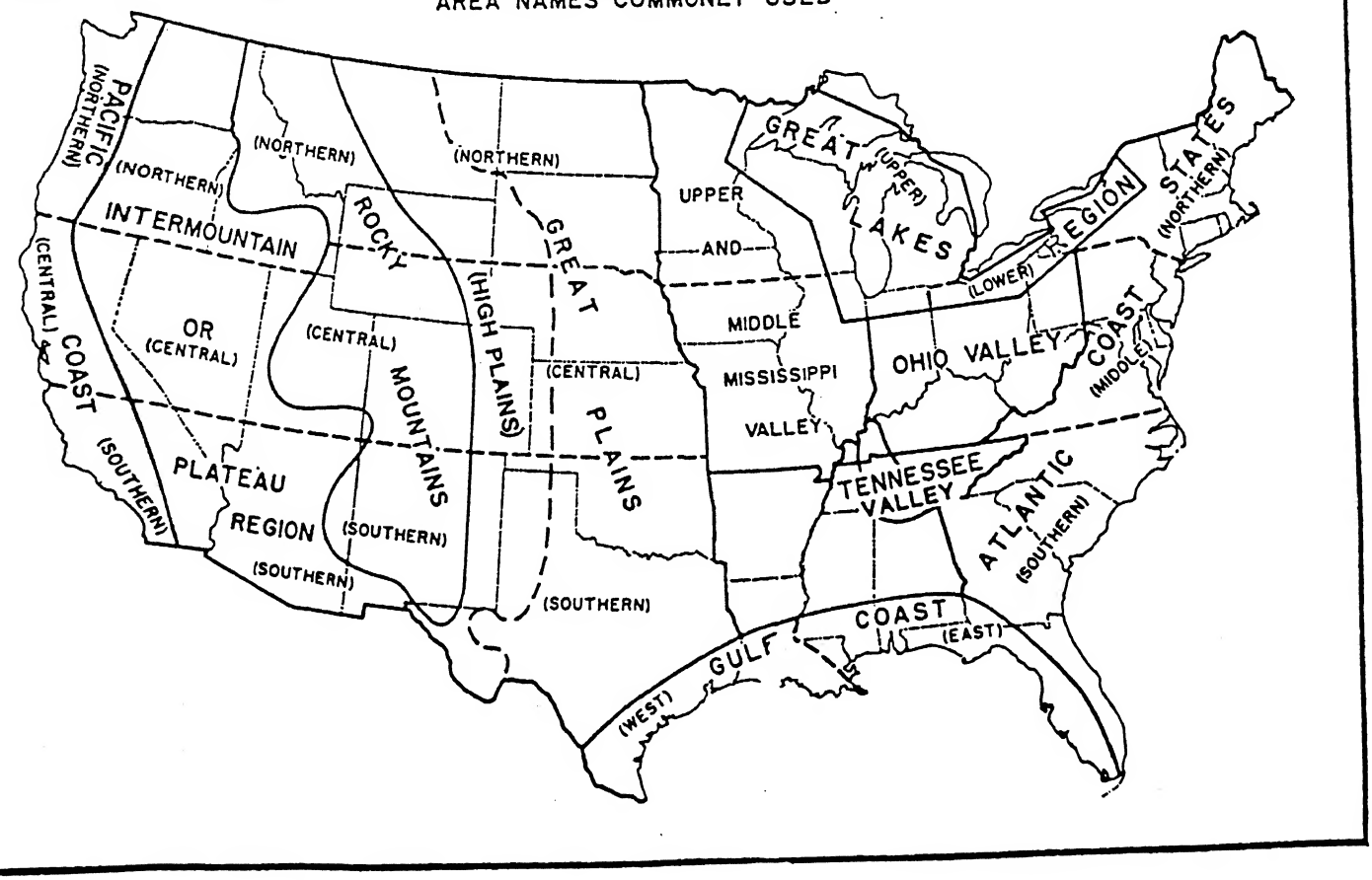
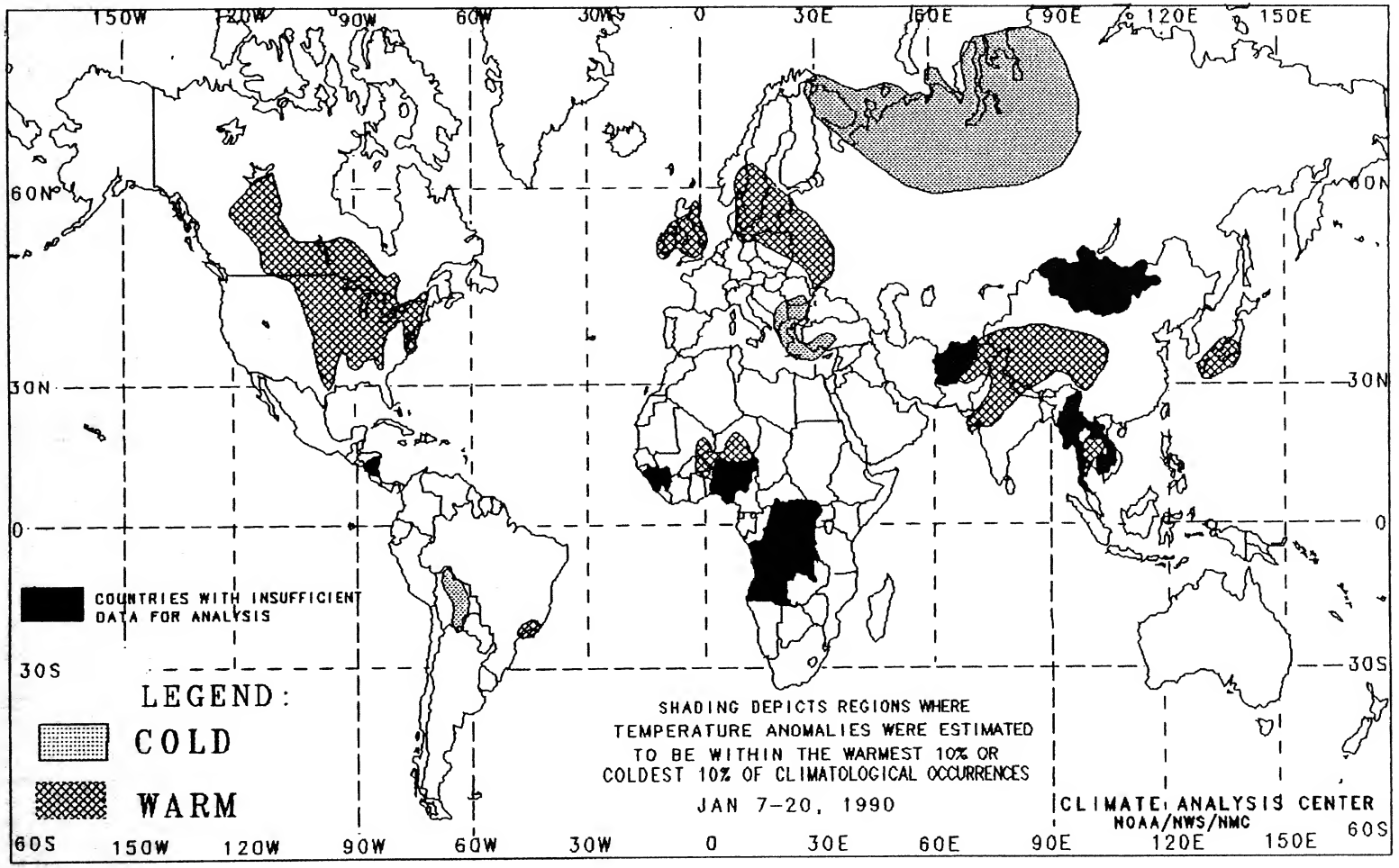


GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



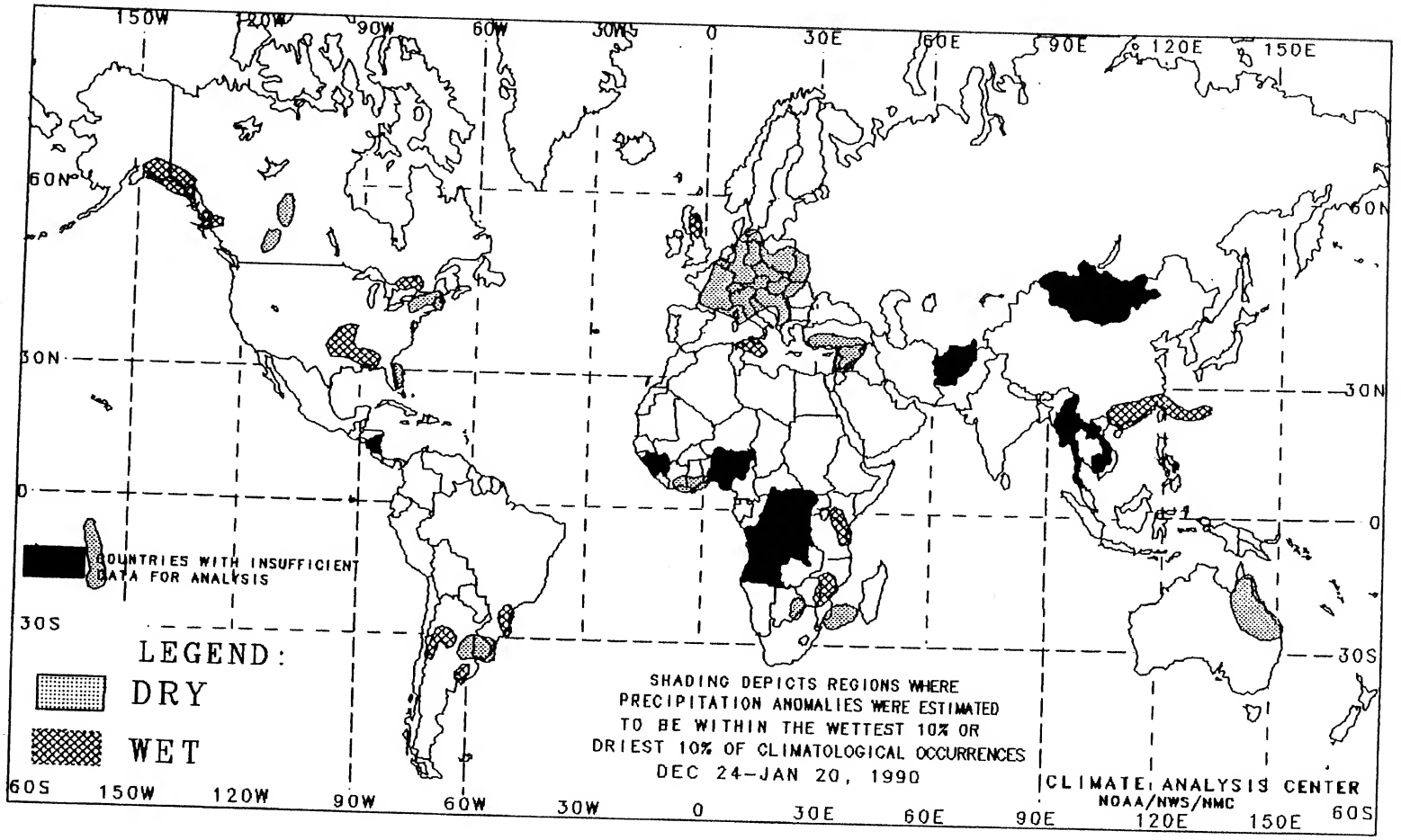
The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty–four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

ANNUAL CLIMATE SUMMARY

MAJOR CLIMATIC EVENTS AND ANOMALIES AROUND THE WORLD DURING 1989

1. Uruguay and Argentina:

PROLONGED DRYNESS JANUARY THROUGH MAY.

Unusually dry weather during 1988 persisted into 1989. In early January abnormally warm, dry conditions spread from northern Argentina into Uruguay. Cooler air brought relief from the high temperatures late in the month but hot weather returned by late January. During February the unusually dry conditions exacerbated by abnormally high temperatures spread southward until it covered most of Uruguay and the northern half of Argentina. Very hot, dry weather persisted until late March when colder air brought an end to well above normal temperatures. The lack of precipitation continued until early April when scattered showers brought short–term relief; however, long–term precipitation deficits remained as the dry season began in late May.

2. Central United States and South Central Canada:

LONG–TERM PRECIPITATION DEFICITS OCCUR.

Unseasonably dry weather spread across the north central United States during March and April. Rains were spotty during May as dryness spread across the central United States and south central Canada. Heavy showers in late May were not intense enough or widespread enough to eliminate long–term precipitation deficits in most areas. Scattered rain showers continued into June and July; however, few areas received consistent rains. By the end of July rains became more widespread and brought short–term relief, but long–term rainfall deficits remained.

3. Australia:

THE "BIG WET" OF 1989.

Heavy precipitation invaded Australia during the middle of March and spread across the central, southern and southeastern parts of the country. During April the wet weather regime, characterized by very heavy showers, concentrated itself into the eastern quarter of the continent. Although early May saw diminished rains, above normal precipitation totals dominated eastern Australia for the rest of the month. After a brief respite at the end of May and beginning of June more heavy showers fell along the southeastern coast. In late June and early July the rains diminished. "Big Wet" finally ended in the middle of the month.

4. Europe and the Middle East:

MILD, DRY WINTER SEASON.

Unusually dry conditions developed across northern Italy and spread across southern Europe by late January. By the end of January unusually mild conditions developed in northern Europe and abnormally dry conditions dominated the entire continent. Mild weather persisted across Europe during February and March; however, welcome rains in March brought relief from the dryness. In late March and early April the unseasonably warm weather spread across central and southern Europe. March was the warmest on record. The abnormal warmth persisted into April, but by the end of the month colder air invaded Europe and brought an end to the prolonged warm spell.

5. Siberia:

UNUSUALLY MILD THROUGH APRIL.

The abnormally mild winter regime of late 1988 lingered across Siberia into 1989. In January the warm anomaly was most intense at various stations around Lake Baykal. By the middle of February unseasonably mild conditions spread across most of Siberia and the greatest positive temperature departures, up to 21°C, occurred. In March the relatively warm weather dominated south central and extreme eastern Siberia. In April the unseasonably mild conditions shifted to the southeast and by the beginning of May below normal temperatures spread across Siberia and ended six months of well above normal temperatures.

6. Eastern United States:

UNSEASONABLY WET WEATHER PREVAILS FROM MAY THROUGH JULY.

May began with very heavy rains, over 300 mm in the first week of the month, in the Southeast and along the Atlantic coast. The very wet weather covered the entire eastern third of the continental United States and brought flooding to the Ohio River Valley late in May. After a brief break in early June the rains returned. Tropical Storm Allison brought extremely heavy rains, up to 600 mm, during the last week of June, as the persistently wet weather regime continued. During July the rainy conditions tapered off and by the end of the month conditions returned to near normal.

7. Central United States:

MORE DRYNESS AT THE END OF THE YEAR.

Very little precipitation occurred across the midsection of the United States, particularly in the Great Plains and the lower Mississippi Valley, during much of October, November, and December. Significant precipitation was reported in Kansas, Oklahoma, and Texas in early November. Short–term moisture deficits eased as cold weather and occasional moderate precipitation fell in the central Great Plains during late December; however, long–term moisture deficits persisted.

8. Coastal Sections of British Columbia and Alaska:

DRY SPELL PREVAILS DURING SPRING.

Very dry conditions developed during March along the southeast coast of Alaska and the west coast of British Columbia. By April the unusually dry weather spread across the southern Alaskan coast to the Alaska Peninsula as the jet stream shifted northward and eastward. In May rains returned to southern Alaska; however, the Panhandle and adjacent British Columbia continued to experience a lack of rain. A frontal system stalled across the region in late May and early June and provided welcome relief from the dry spell.

9. Eastern and Central United States:

VERY WET AUGUST THROUGH OCTOBER.

Abundant rainfall left the soil saturated in many parts of the east central United States during late August and early September. By the middle of September abnormally wet conditions extended further south and east. Hurricane Hugo inundated the Carolinas

while very dry conditions developed in the central United States. Excessive rains at the end of September and early October were reported in the eastern states. After a brief respite from the rain during the middle of October more wet weather occurred across the East. Precipitation remained plentiful until the end of October and the beginning of November when drier conditions and delightful autumn weather brought an end to the abnormally wet regime.

10. Europe:

YEAR–END WARM SPELL PREVAILS.

Most of Europe experienced unusually mild weather in early November. Colder air invaded western Europe during the middle of the month; however, by late November warm conditions returned. Heavy rains and southwesterly flow dominated the Iberian Peninsula which resulted in warm, wet weather for Spain and Portugal throughout much of December. Late in the month the mild weather engulfed much of the Continent and by the end of the year the warmth extended well into the southern European Soviet Union.

11. China, Korea, and Japan:

MILD CONDITIONS FROM MARCH THROUGH MAY.

Unusually mild conditions prevailed in Japan, Korea, and the vicinity of Beijing, China during March. Late in the month the above normal temperatures had spread across northeastern China. Very warm weather persisted through most of April, but by the end of the month colder air brought near normal temperatures to the region. In May a shorter warm spell occurred in Korea and northeastern China; however, by the middle of May below normal temperatures prevailed.

12. Japan and South Korea:

VERY WET SEPTEMBER AND OCTOBER.

Heavy rains pounded Japan and South Korea in early September as Tropical Storm Roger passed by. The abnormally wet weather persisted throughout September and late in the month conditions were exacerbated by Typhoon Wayne. Honshu Island of Japan experienced the wettest September on record. October saw relatively drier weather; however, near normal conditions did not return until the latter part of October.

13. North America:

BITTER COLD DOMINATES IN DECEMBER.

Record–breaking cold and heavy snows marked an early winter for much of North America. In the middle of November, extremely cold conditions developed in Alaska and northwestern Canada. By late November, radiative cooling during the long nights enlarged the pool of bitterly cold Arctic air sufficiently enough to cause it to shift southeastward. In early December the first Arctic air mass stagnated over New England. Another Arctic blast surged southeastward in the middle of the month and the bitter cold tightened its grip on the entire United States east of the Rockies. At the end of the year temperatures began to moderate as a record–breaking cold December ended across much of the United States.

14. Turkey and the Middle East:

SPRING DRY SPELL.

Unusually dry conditions prevailed across Turkey and the Middle East since the beginning of the year. The driest weather occurred during spring; however, by the middle of June rain showers brought relief from the dry regime.

15. Southeastern and Eastern United States:

VERY DRY JANUARY TO EARLY MARCH.

Unusually dry conditions developed across the eastern United States during January. Many stations on the East Coast had less than half their normal rainfall since December. In the middle of February heavy snow fell in the eastern United States and by the end of the month only Florida remained abnormally dry. During March heavy rain showers brought relief to Florida.

16. Northwestern United States and Southwestern Canada:

LARGE PRECIPITATION DEFICITS DURING RAINY SEASON.

The rainy season normally reaches its maximum during the winter months (December – February). Abnormally dry conditions developed in early January and persisted to the middle of February when storms reached southwestern British Columbia. By the middle of March short–term precipitation amounts were near normal, but long–term deficits remained.

17. Europe:

A HOT SUMMER.

A prolonged heat wave prevailed across much of Europe from the middle of July until early September. The heat wave started in western Europe and spread across most of the continent by early August. Persistent southerly flow kept feeding warm tropical air into Europe, especially France and the Iberian Peninsula. After a change in the upper air flow in early September cool, wet weather ended the prolonged warm spell.

18. Caribbean Islands:

PROLONGED DRY SPELL ENDS WITH A DESTRUCTIVE HURRICANE.

A marked lack of convective activity dominated the Caribbean, especially the Lesser Antilles from early June until the middle of September. Overdue rains fell in the middle of August and again in early September; however, these rains were spotty and confined to the Windward Islands. In the middle of September a powerful storm, Hurricane Hugo, brought high winds and heavy rain. This ended the dryness in a dramatic and destructive manner.

19. Texas and Mexico:

EARLY SEASON HEAT WAVE DURING JUNE.

Very high temperatures, with several stations reporting values above 40°C or more, developed at the end of May and persisted into early June. By the middle of June the heat wave abated in Texas and near normal temperatures returned to Mexico the following week.

20. Northeastern Australia:

LATE YEAR WET WEATHER.

Unusually wet weather developed across northeastern Australia during November. Much of Queensland experienced very heavy rain during the first half of December. In the middle of the month, Tropical Storm Felicity crossed the Northern Territories and Queensland. By the end of December, cooler, drier air moved into the region and brought an end to the wet regime.

SIGNIFICANT BELOW NORMAL PRECIPITATION ANOMALIES DURING 1989

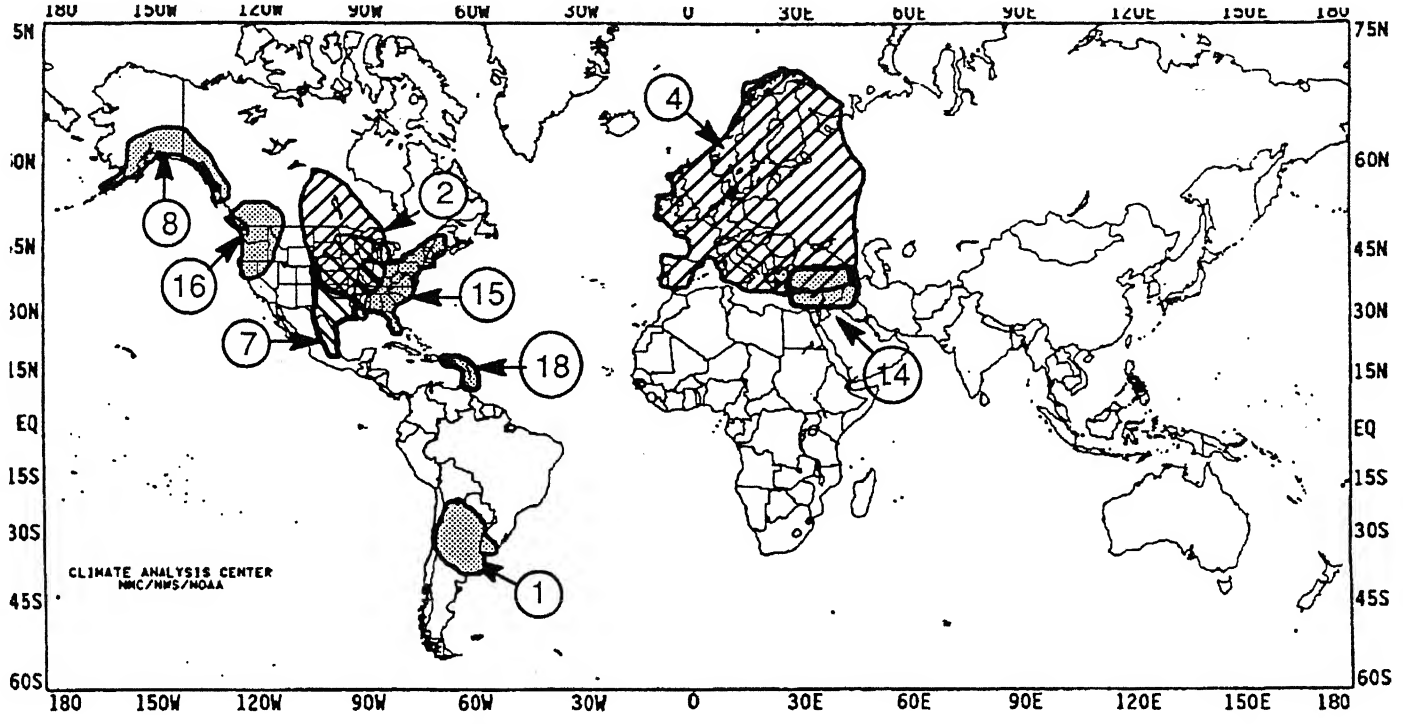


Figure 1. Significant below normal precipitation (dry) anomalies during 1989.

SIGNIFICANT ABOVE NORMAL PRECIPITATION ANOMALIES DURING 1989

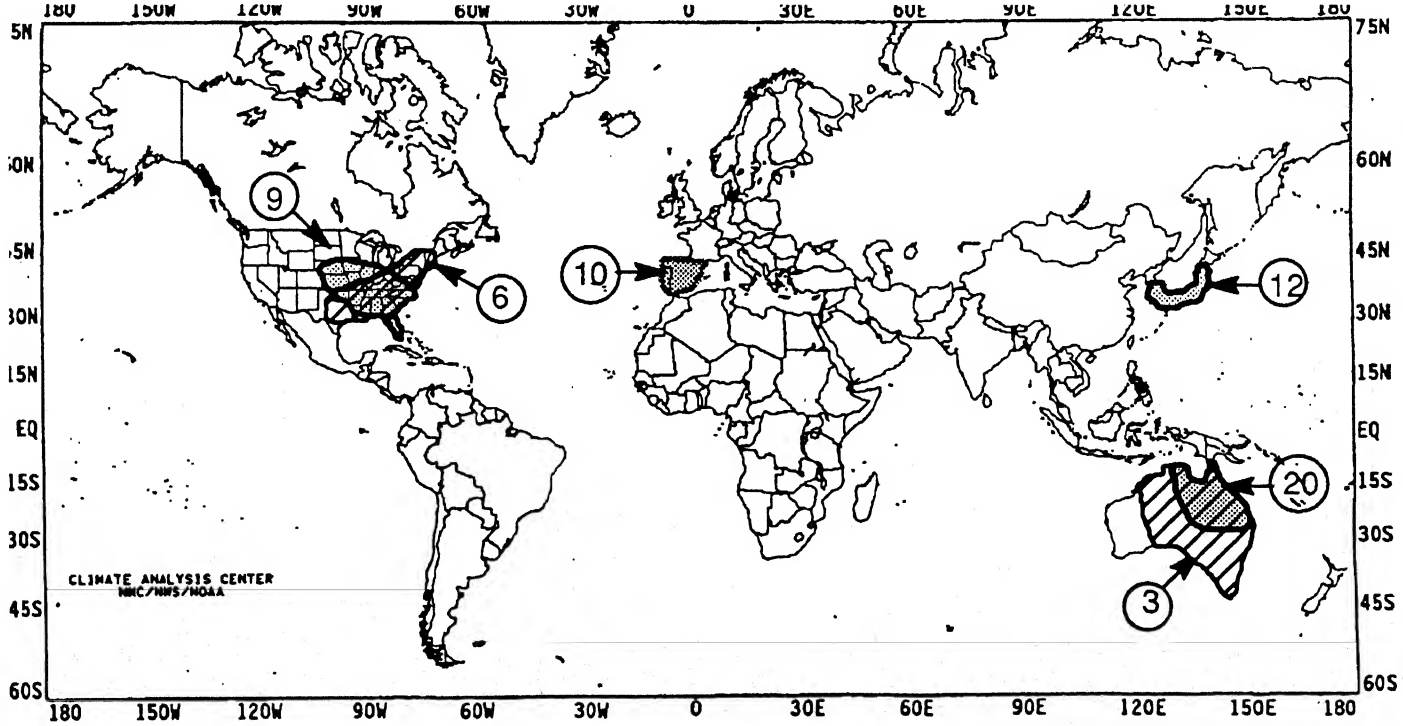


Figure 2. Significant above normal precipitation (wet) anomalies during 1989.

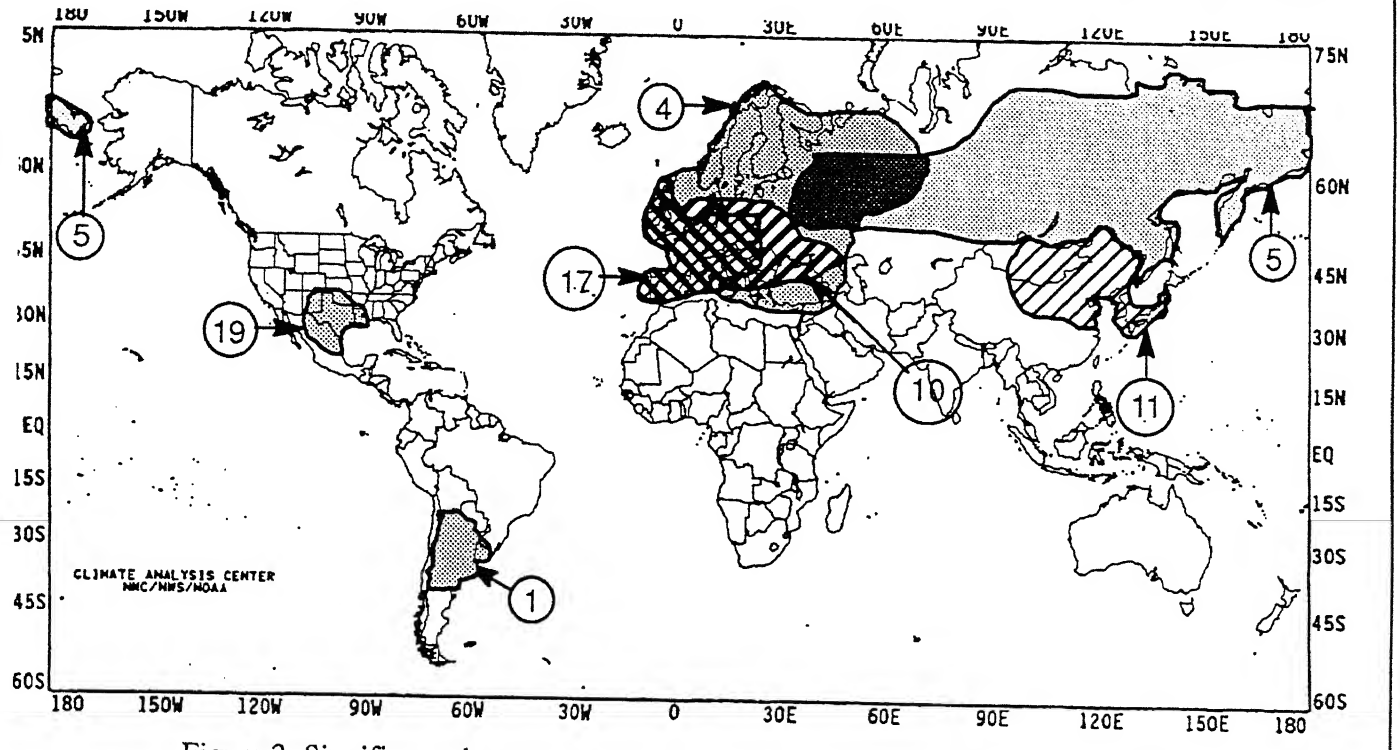


Figure 3. Significant above normal temperature (warm) anomalies during 1989.

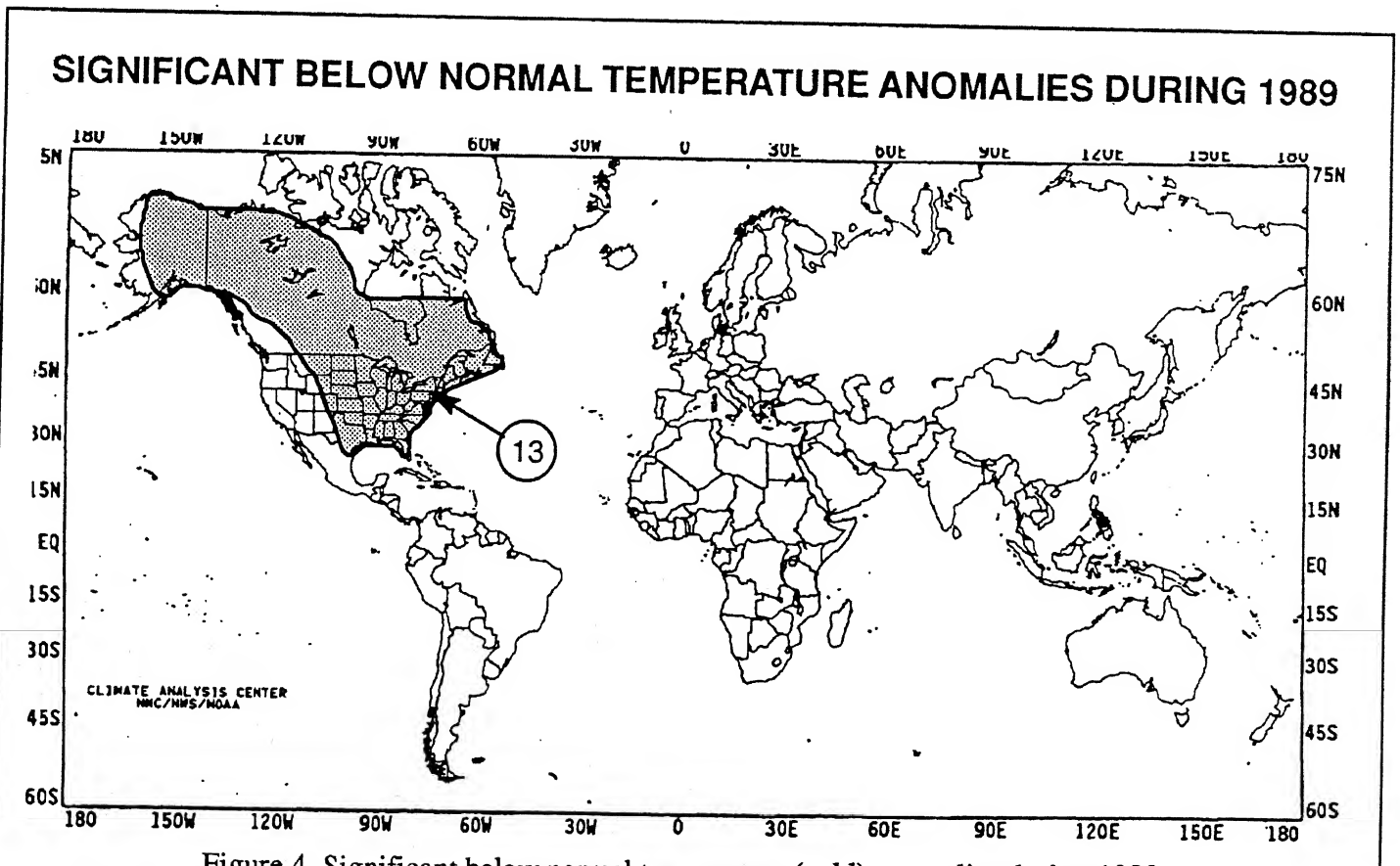
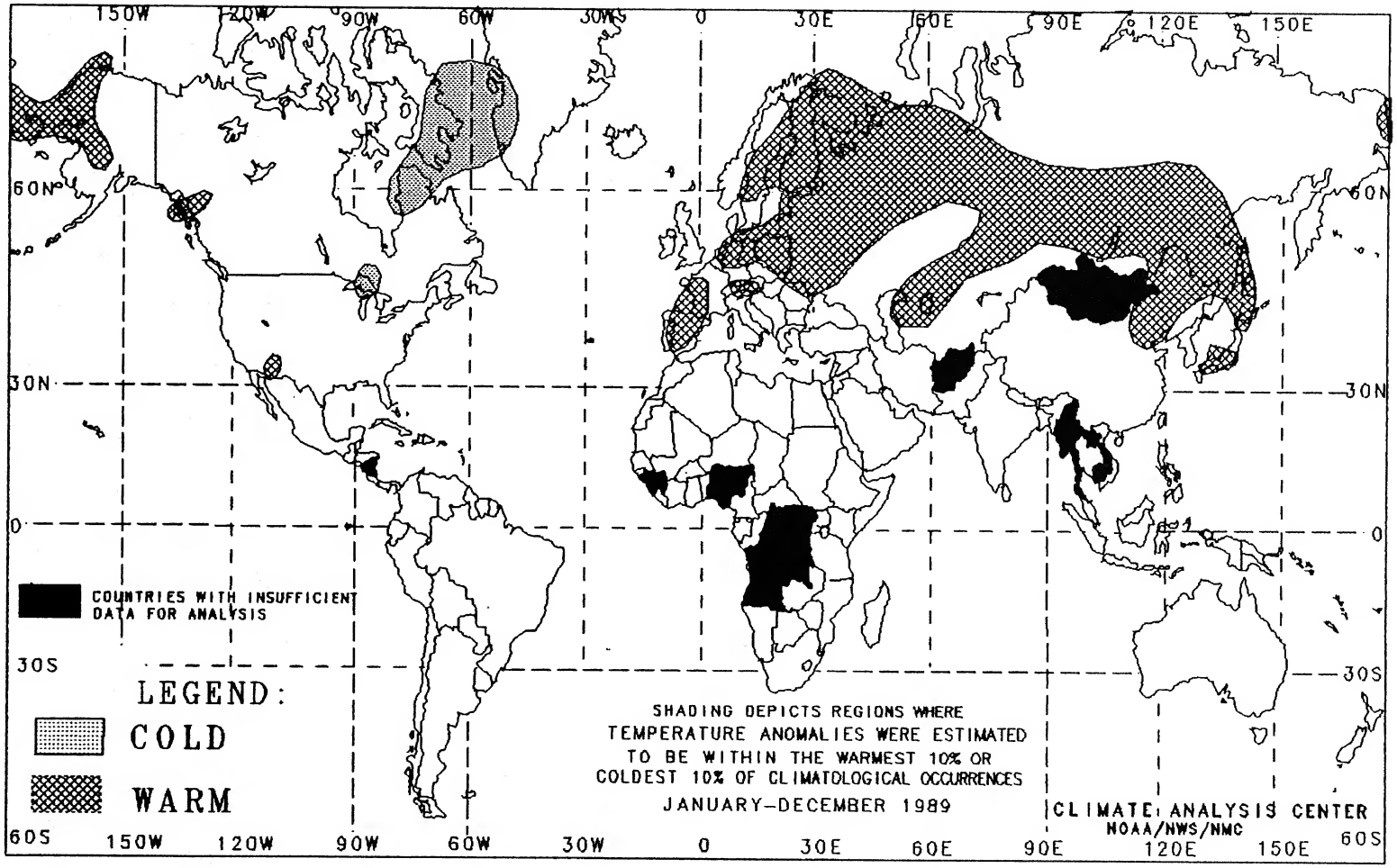


Figure 4. Significant below normal temperature (cold) anomalies during 1989.

GLOBAL TEMPERATURE ANOMALIES

JANUARY 1989 – DECEMBER 1989



The anomalies on this chart are based on approximately 2500 observing stations for which at least 328 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

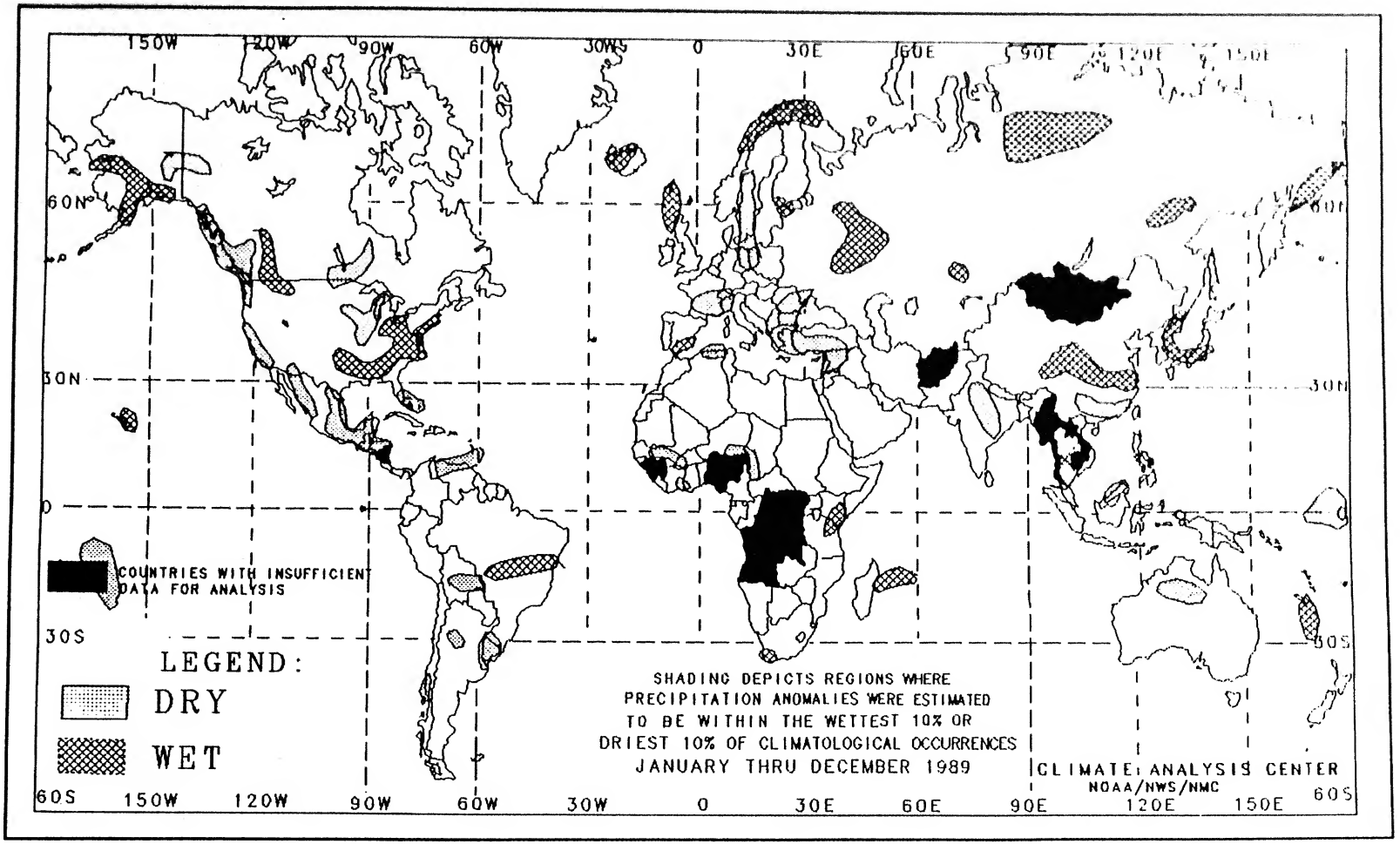
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.2°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of twelve month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

JANUARY 1989 – DECEMBER 1989



The anomalies on this chart are based on approximately 2500 observing stations for which at least 350 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the twelve month period is less than 100 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total twelve month precipitation exceeds 250 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of twelve month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

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* Indicates a **Special Climate Summary** was published.

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SPECIAL CLIMATE SUMMARIES PUBLISHED DURING 1989

Numbers refer to week of publication in the *Weekly Climate Bulletin.*